

## Roading Database Case Study - suggested Partial set of Business Rules for the Conceptual ERD

Suggested Partial set of Business Rules for the Conceptual ERD are given in the table below:

**Note:**

1. Only one side of the relationship is included for all relations except for many-to-many relationships (see point 3 below). You must derive the other side of the relationship based on the business rules.
2. Entity names are based on the names used in the case study - you may use different names.
3. Business rules for **many-to-many** relationships are shown in **coloured text (both sides of the relationship are included)** – you must transform these to equivalent logical relationships, i.e., by applying the mapping rules of transforming a conceptual ERD to a logical ERD.

|             | ENTITY 1        | May/Must<br>(Participation) | verb                      | number<br>(Cardinality) | ENTITY 2                             |
|-------------|-----------------|-----------------------------|---------------------------|-------------------------|--------------------------------------|
| <b>EACH</b> | ROAD CATEGORY   | may be                      | <i>used by</i>            | zero or many            | ROAD                                 |
|             | LOCATION        | may                         | <i>have</i>               | zero or many            | ROAD<br>(that start at the location) |
|             | LOCATION        | may                         | <i>have</i>               | zero or many            | ROAD<br>(that end at the location)   |
|             | ROAD            | maybe                       | <i>part of</i>            | zero or many            | ROAD                                 |
|             | <b>PROJECT</b>  | <b>must</b>                 | <b><i>involve in</i></b>  | <b>one or many</b>      | <b>ROAD</b>                          |
|             | <b>ROAD</b>     | <b>may be</b>               | <b><i>involved in</i></b> | <b>zero or many</b>     | <b>PROJECT</b>                       |
|             | PROJECT         | may                         | <i>involve</i>            | zero or many            | CONTRACT                             |
|             | CONTRACT        | may                         | <i>have</i>               | zero or many            | EMPLOYEE<br>(as managers)            |
|             | <b>ROLE</b>     | <b>may be</b>               | <b><i>assigned to</i></b> | <b>zero or many</b>     | <b>EMPLOYEE</b>                      |
|             | <b>EMPLOYEE</b> | <b>may be</b>               | <b><i>assigned</i></b>    | <b>zero or many</b>     | <b>ROLE</b>                          |